SPECIFICATION

In the specification, please substitute page 16 that follows for page 16 originally filed.

In the foregoing description, the source of fluorine is SiF_4. As evident to those skilled in the art, other sources of fluorine may be used. For example, $SiHF_3$, SiH_2F_2 , SF_6, CF_4, may also be suitable. These will result in index depression equivalent to that produced by SiF_4. However, instead of contending with SiF_4 as low as 10^{-9} atmospheres, low temperature F^- doping can be regulated to provide the desired index depression at SiF_4 partial pressures above 1% and typically 10% or more. As indicated earlier, the fluorine predeposits on the individual particles as primarily a molecular species. The drive-in mechanism primarily involves diffusion of atomic fluorine. To amplify this important distinction, which is a main characteristic of the invention, the predeposition step is described as involving predeposition of fluorine, and the drive-in as diffusion of fluorine.

The process described herein is especially useful for producing large sol-gel optical fiber preforms. Large sol-gel bodies in current commercial parlance means bodies with a weight greater than 5 kg. The production of such large optical preforms by sol-gel techniques has presented a major challenge, largely because the time required for doping these large preforms by the equilibrium technique is prohibitively long. Thus the invention, when placed in this commercial context, provides an especially unobvious advantage. Preforms this large typically have a diameter greater than 50 mm, and frequently greater than 75 mm.

In concluding the detailed description, it should be noted that it will be obvious to those skilled in the art that many variations and modifications may